<u>WHAT IS CLAIMED IS:</u>

1.   A method of obtaining bandwidth requests from a plurality of users of a communication base station which provides communication uplink bandwidth on request to the users, the method comprising:

selecting a communication parameter which varies over time;

determining and storing a parameter value representing the communication parameter applicable to a particular user;

selecting a polling rate for the particular user in accordance with the parameter value stored for that user;

periodically polling the particular user for bandwidth requests at the selected polling rate;

(i) updating the stored parameter value for the particular user to reflect a change in the communication parameter quantity applicable to the particular user; and

(ii) changing the polling rate for the particular user in response to the changed parameter value.

2.   The method of Claim 1, further comprising selecting a plurality of communication parameters, and changing the polling rate in response to changes in any of the communication parameters.

3.   The method of Claim 1, further comprising selecting a common communications parameter common to a plurality of users sharing a link, and changing the polling rate for the particular user in response to changes in the common parameter.

4.   The method of Claim 1, further comprising selecting a common communications parameter reflective of composite activity of a plurality of users sharing a link, and changing the polling rate for the particular user in response to changes in the common parameter.

5.   The method of Claim 1 wherein the base station and the users communicate across a broadband wireless communication link.

6.   The method of Claim 1 wherein polling comprises providing unrequested uplink bandwidth as an opportunity to request further bandwidth.

-60-

7. The method of Claim 1 wherein each user comprises a customer premises equipment (CPE) station configured to provide communications for a plurality of connections associated with the CPE station.

8. The method of Claim 1 wherein each user is an individual connection.

9. The method of Claim 8 wherein the plurality of users is connected to the base station through one or more corresponding customer premise equipment (CPE) stations, and polling the particular user comprises directing the corresponding CPE station to grant unrequested bandwidth to the particular user connection.

10. The method of Claim 1 wherein the parameter value for each user reflects a previous rate of use of bandwidth by the user.

11. The method of Claim 1 wherein the parameter value for each user reflects a quality of service requirement for the user.

12. The method of Claim 1 wherein the step of further comprising combining a plurality of different communication parameters to form a composite communication parameter, such that the parameter value for the particular user reflects a plurality of distinct communication parameter quantities applicable to the particular user.

13. The method of Claim 12 wherein the plurality of distinct communication parameter quantities includes a quantity reflecting previous bandwidth use by the particular user and a quantity reflecting a quality of service requirement for the particular user.

14. The method of Claim 1 wherein the step of selecting a polling rate and the step of changing a polling rate are both new polling rate selection steps which further comprise basing the new polling rate selection upon a plurality of communication parameter quantities applicable to the particular user.

15. The method of Claim 14 wherein the plurality of distinct communication parameter quantities includes a quantity reflecting previous bandwidth use by the particular user and a quantity reflecting a quality of service requirement for the particular user.

16. The method of Claim 1 wherein the step of selecting a polling rate for the particular user further comprises categorizing the particular user in one polling category of a finite number of polling categories in accordance with the parameter value and selecting a polling rate in accordance with the selected polling category, and the step of changing the

polling rate for the particular user comprises categorizing the particular user in a different one of the polling categories, and changing the polling rate for the particular user to accord with the different polling category.

17. The method of Claim 1 wherein the step of changing the polling rate for the particular user comprises categorizing the particular user in a different one of a finite number of polling categories based upon the changed parameter value of the particular user, assigning the particular user to a polling group of users according to the polling category of the particular user, and changing the polling rate for the particular user dependent upon the polling group to which the user is assigned.

18. The method of Claim 1 wherein the step of changing the polling rate for the particular user comprises selecting from a substantially continuous spectrum of polling rates dependent at least in part on the parameter value.

19. The method of Claim 1, further comprising changing the polling rate for the particular user to zero.

20. The method of Claim 1 wherein the step of changing the polling rate for the particular user comprises basing the changed polling rate selection upon a plurality of communication parameter quantities of the particular user.

21. The method of Claim 1, further comprising providing a contention request mechanism to obtain bandwidth requests from users whereby bandwidth is provided during which a plurality of users may request bandwidth.

22. The method of Claim 21, further comprising providing the contention request mechanism to users assigned a zero rate of polling.

23. The method of Claim 1, further comprising providing a "poll-me" mechanism wherein a particular user sets values of one or more bits of data within uplink bandwidth previously assigned to the particular user, and the particular values set for the data bits conveys a request for the base station to provide bandwidth within which the particular user can request allocation of bandwidth.

24. The method of Claim 1, wherein the polling rate for a particular user is set to zero when an existing pattern of uplink bandwidth usage by the particular user provides

"poll-me" opportunities sufficient to obtain bandwidth meeting the QoS guarantee for the particular user.

25. The method of Claim 24, wherein uplink bandwidth is allocated to the particular user at least at a rate determined by a user uplink constant bit rate (CBR) data connection and provides the sufficient "poll-me" opportunities.

26. The method of Claim 24, further comprising selecting a common communications parameter common to a plurality of users sharing a link, and changing the polling rate for the particular user in response to changes in the common parameter.

27. The method of Claim 26, wherein the base station and the users communicate across a broadband wireless communication link, and wherein polling comprises providing unrequested uplink bandwidth as an opportunity to request further bandwidth.

28. The method of Claim 1, further comprising providing a mechanism to embed a request for bandwidth within previously granted uplink bandwidth.

29. The method of Claim 28, further comprising selecting a polling rate of zero for users whose present rate of uplink bandwidth usage provides opportunities to embed bandwidth requests within the presently allocated bandwidth sufficient to initiate bandwidth increases satisfying all bandwidth changes required by a quality of service guaranteed to the user.

30. The method of Claim 29, further comprising selecting a common communications parameter common to a plurality of users sharing a link, and changing the polling rate for the particular user in response to changes in the common parameter.

31. A method of obtaining bandwidth requests from a plurality of users of a communication base station which provides communication uplink bandwidth on request to the users, the method comprising:

assigning a particular user to one of a plurality of polling categories;

selecting a polling rate for the particular user in accordance with the polling category of that user;

periodically polling the particular user for bandwidth requests at the selected polling rate;

(i) assigning the particular user to a different polling category in response to a change in a communication status of the particular user; and

(ii) changing the polling rate for the particular user in accordance with the different polling category to which the user is assigned.

32. The method of Claim 31, wherein polling the particular user includes multicast polling to a multicast polling group including the particular user and another user.

33. The method of Claim 32, wherein each member of the multicast polling group is assigned to the polling category to which the particular user is assigned.

34. The method of Claim 33, wherein assigning the particular user to a polling category further comprises selecting the polling category based upon a value of a selected communication parameter applicable to the particular user.

35. The method of Claim 34, wherein the selected communication parameter reflects modulation level or a forward error correction scheme.

36. The method of Claim 35, wherein the members of the multicast polling group are selected at least in part on a shared modulation level.

37. The method of Claim 31, including providing contention polling to all users assigned to at least one of the plurality of polling categories.

38. The method of Claim 31, wherein assigning the particular user to a polling category further comprises selecting the polling category based upon a value of a selected communication parameter which is applicable to the particular user.

39. The method of Claim 31, further comprising assigning a plurality of users which are assigned to a particular polling category to a first multicast polling group.

40. The method of Claim 39, further comprising

assigning, to a second multicast polling group, a plurality of users which are assigned to the particular polling category and not to the first multicast polling group;

multicast polling the first multicast polling group during a first time period; and

multicast polling the second multicast polling group during a different second time period.

41.   The method of Claim 39, further comprising assigning users to the particular polling category based upon a previous rate of uplink bandwidth usage by each user.

42.   The method of Claim 33, further comprising assigning each user to a polling group based at least in part upon quality of service requirements of the user.

43.   A method of obtaining bandwidth requests from a plurality of users of a communication base station which provides communication uplink bandwidth on request to the users, the method comprising:

assigning a plurality of the users to a particular one of a plurality of polling groups;

selecting a polling rate for the users assigned to the particular polling group in accordance with a communication parameter associated with the group;

periodically polling the users of the particular polling group for bandwidth requests at the selected polling rate; and

selecting a different polling rate for the users in the particular group in accordance with a change in the communication parameter associated with the group.

44.   The method of Claim 43 wherein all users in a particular polling group are connections which share a common CPE station.

45.   The method of Claim 43 wherein all users in a particular polling group share the same modulation scheme.

46.   The method of Claim 43 wherein all users in a particular polling group share the same forward error correction scheme.

47.   The method of Claim 43 wherein all users of a particular polling group share the same quality of service requirements.

48.   A system for obtaining user uplink bandwidth requests in a communication station providing varying uplink bandwidth to a plurality of users which share a communication link to the station, the system comprising:

a polling policy module configured to obtain values of a first selected communication parameter which vary uniquely over time for a particular user, and to change a polling protocol for the user in response to a change in the value of the communication parameter;

a polling control module configured to direct polling of the particular user in accordance with the changed polling protocol; and

a channel bandwidth allocation module configured to direct an allocation of uplink bandwidth to the user in accordance with the polling directed for the particular user.

49.   The system of Claim 48, wherein the polling policy module is further configured to obtain a value of an additional communication parameter, and to change the polling protocol for the user in response to changes in the additional communication parameter.

50.   The system of Claim 49, wherein the polling policy module is further configured to form a composite communication parameter for the user reflecting the first communication parameter and the additional communication parameter, and to change the polling protocol for the user in response to changes in the composite communication parameter.

51.   The system of Claim 49, wherein the communication parameters include a parameter reflecting previous bandwidth use by the particular user and a parameter reflecting a quality of service requirement for the particular user.

52.   The system of Claim 48, wherein the polling policy module is further configured to obtain a common communications parameter common to a plurality of users sharing a link, and to change the polling protocol for the particular user in response to a change in the common parameter.

53.   The system of Claim 48, wherein the change in polling protocol is a change in a rate of polling the user.

54.   The system of Claim 48, wherein the change in polling protocol is between periodically polling the user and polling the user only upon request.

55.   The system of Claim 48, further comprising an individual poll module configured to direct polls to users individually, and a multicast polling module configured to direct polls to groups of users concurrently, wherein the change in polling protocol is a change between individually polling the user and multicast polling the user.

56.   The system of Claim 55, further comprising a contention resolution module configured to resolve bandwidth request collisions.

57.   The system of Claim 48, further comprising a broadband wireless communication link to the users.

58.   The system of Claim 48, wherein the channel bandwidth allocation module is further configured to poll users by allocating unrequested uplink bandwidth to the users as an opportunity to request further bandwidth.

59.   The system of Claim 48, further comprising uplink subframe map queues configured to specify distribution of uplink bandwidth between a plurality of users sharing a communication link to the system station.

60.   The system of Claim 48, wherein each user is a group of one or more individual connections treated as a logical unit sharing a common identifier value.

61.   The system of Claim 48 wherein the first communication parameter value for each user reflects a previous rate of bandwidth use by the user.

62.   The system of Claim 48 wherein the first communication parameter value for each user reflects a composite quality of service requirement for a plurality of connections of the user.

63.   The system of Claim 48, further comprising a poll-me message processing module configured to examine an uplink receive queue for messages indicating a request to be polled.

64.   The system of Claim 48, further comprising a bandwidth request processing module configured to derive uplink bandwidth requests from received uplink data, and to direct the channel bandwidth allocation module to allocate bandwidth to requesting users in corresponding uplink subframe maps.

65.   The system of Claim 64, wherein the bandwidth request processing module is further configured to derive bandwidth requests piggybacked on data packets.

66.   The system of Claim 48, wherein the polling policy module is further configured to categorize the particular user in one of a finite number of polling categories, and to select the polling protocol for the user in accordance with the selected polling category.

67.   The system of Claim 48, wherein the polling policy module is further configured to halt polling for a particular user when an existing pattern of uplink bandwidth usage by the particular user provides "poll-me" opportunities sufficient to obtain bandwidth meeting the QoS guarantee for the particular user.

68.   A system for obtaining bandwidth requests from a plurality of users of a communication base station which provides communication uplink bandwidth on request to the users, the system comprising:

a channel bandwidth allocation module configured to direct provision of unrequested bandwidth to the particular user in accordance with a selected polling rate; and

a polling policy module configured to:

assign a particular user to one of a plurality of polling categories,

select a polling rate for the particular user in accordance with the polling category of that user,

assign the particular user to a different polling category in response to a change in a communication status of the particular user, and

change the polling rate for the particular user in accordance with the different polling category to which the user is assigned.

69.   The system of Claim 68, wherein the polling policy module is further configured to select the polling category of the particular user based at least in part upon a value of a selected communication parameter applicable to the particular user.

70.   The system of Claim 69, wherein the selected communication parameter reflects modulation level or a forward error correction scheme.

71.   The system of Claim 70, further comprising a multicast polling module configured to assign the particular user to a multicast polling group based at least in part upon a modulation level shared with other members of the multicast polling group.

72.   The system of Claim 69, further comprising a multicast polling module, wherein the polling policy module is further configured to direct the multicast polling module to direct contention polling of all users assigned to at least one of the plurality of polling categories.

73.   The system of Claim 72, wherein the multicast polling module is configured to assign a plurality of users which are assigned to the at least one polling category to a first multicast polling group.

74.   The system of Claim 73, further comprising a channel bandwidth allocation module, and wherein the multicast polling module is further configured to

assign, to a second multicast polling group, a plurality of users which are assigned to the particular polling category and not to the first multicast polling group;

direct the channel bandwidth allocation module to multicast poll the first multicast polling group during a first time period; and

direct the channel bandwidth allocation module to multicast poll the second multicast polling group during a different second time period.